

## BiOWiSH<sup>®</sup> Crop Liquid

### Evaluation of BiOWiSH<sup>®</sup> Crop Liquid on Winter Wheat Yield in North-Central China



#### Executive Summary

BiOWiSH Technologies, Inc. engaged China Agricultural University to conduct a study to determine the effects of BiOWiSH<sup>®</sup> Crop Liquid coated onto urea as an Enhanced Efficiency Fertilizer (EEF) in a winter wheat rotation in the north-central Chinese province of Hebei.

The trial compared two treatments:

- Control, Standard Fertility Program
- N Optimized Fertility Program + BiOWiSH<sup>®</sup> Crop Liquid

In this study, the N Optimized Fertility Program + BiOWiSH<sup>®</sup> Crop Liquid treatment was observed to have a winter wheat yield increase of 6.2% (0.5 MT/ha, 7.5 bu/acre).

#### Background

##### About BiOWiSH Technologies

Headquartered in Cincinnati, Ohio, BiOWiSH Technologies, Inc. is a global provider of biotechnology solutions. As a leader in the agricultural market, we help farmers increase crop production sustainably, safely, and cost effectively. Our revolutionary BiOWiSH<sup>®</sup> Crop Liquid is a blend of proprietary microbial cultures that can be coated onto dry fertilizer or mixed with liquid fertilizers to create an enhanced efficiency fertilizer. BiOWiSH<sup>®</sup> endophytic *Bacillus* deliver soil nutrients to crops through the rhizophagy cycle creating a symbiotic relationship between the plant and soil microbes. This helps farmers achieve consistent results across a broad range of operating conditions, climates, and environments. By unifying nature and science, BiOWiSH reinvents the way food is grown. For more information, visit [biowishtech.com](http://biowishtech.com).

#### BiOWiSH<sup>®</sup> Crop Liquid



- Optimizes yield potential by improved nutrient uptake
- Increases nutrient use efficiency and supports nutrient uptake
- Optimizes soil conditions for greater root mass
- Improves soil conditions for increased plant vigor
- Enhances beneficial microbes in the rhizosphere

##### Available Size

- 264 gal/1000 L

## About China Agricultural University

China Agricultural University is a public research university in China specializing in advanced agricultural education. China is a large agricultural country with a vast number of distinct soil types and production environments. Agriculture plays a strategic role in the development of the national economy.

## Objectives

The purpose of this study was to evaluate yields in a winter wheat rotation and define the farmer's economic benefit when using a reduced rate of urea coated with BiOWiSH® Crop Liquid as an EEF as compared to the Control.

## Implementation Program

This trial was initiated in spring at the Quzhou Experimental Station of China Agricultural University. A winter wheat rotation followed the summer corn rotation. For winter wheat, the Control treatment total urea application rate was 586 kg/ha (524 lbs/acre), and the N Optimized Fertility Program + BiOWiSH was 392 kg/ha (350 lbs/acre) total. The urea application was split, with 50% broadcasted and incorporated into the soil pre-planting, and 50% topdressed at the jointing growth stage. Each treatment was replicated three times in a randomized complete block design (RCBD).

Table 1. Treatments, Fertilizers, and Application Timings

Treatment	Fertilizer	Application Rate kg/ha [lbs/acre]	Application Phase
Control	Urea	293 [262]	Pre-plant
	Urea	293 [262]	Topdress (jointing)
N Optimized Fertility Program + BiOWiSH® Crop Liquid*	Urea	196 [175]	Pre-plant
	Urea	196 [175]	Topdress (jointing)

\*BiOWiSH® Crop Liquid used at manufacturer's recommended rate.

## Results

### Winter Wheat Yield and Economics

Economic data on winter wheat yield from the study following the corn rotation is presented in the table below. The N Optimized Fertility Program + BiOWiSH® Crop Liquid treatment was observed to have a yield increase of 6.2%, or 0.5 MT/ha (7.5 bu/acre) over the Control. This yield increase translated to a profit change of \$248 USD/ha (\$100 USD/acre) greater than the Control.

Table 2. Yield and Economics

Treatment	Yield MT/ha [bu/acre]	Yield Increase MT/ha [bu/acre]	Yield Increase (%)	Net Income USD/ha [USD/acre]	Profit Change USD/ha [USD/acre]
Control	8.1 [120.4]	-	-	3020 [1222]	-
N Optimized Fertility Program + BiOWiSH® Crop Liquid	8.6 [127.9]	0.5 [7.5]	6.2	3268 [1322]	248 [100]

\*Calculations for conversions between imperial and metric units are based on the original source data; slight rounding differences may occur within reported publication values.

\*\*Net income is the crop value minus the fertility program cost. It does not account for non-fertility expenses.

\*\*\*Profit change is the difference between net income of the respective program and the Control.

## Conclusion

BiOWiSH® endophytic *Bacillus* deliver soil nutrients to crops through the rhizophagy cycle creating a symbiotic relationship between the plant and soil microbes. BiOWiSH® Crop Liquid, when added to an N Optimized Fertility Program for winter wheat, optimized yield potential by improved nutrient uptake. The winter wheat rotation's 6.2% overall yield increase of 0.5 MT/ha (7.5 bu/acre) over the Control increased profit to the grower by \$248 USD/ha (\$100 USD/acre).



**Contact us:**  
 agronomy@biowishtech.com  
 +1 312 572 6700  
 biowishtech.com